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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/506,471

03/25/2005

Arthur Marshall Stoneham

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12/24/2009

WENDEROTH, LIND & PONACK, L.L.P.

1030 15th Street, N.W.,

Suite 400 East

Washington, DC 20005-1503

EXAMINER

SAYADIAN, HRAYR

ART UNIT

PAPER NUMBER

2814

MAIL DATE

DELIVERY MODE

12/24/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/506,471	<b>Applicant(s)</b> STONEHAM ET AL.	
	<b>Examiner</b> HRAYR A. SAYADIAN	<b>Art Unit</b> 2814	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 September 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 and 29 is/are pending in the application.
- 4a) Of the above claim(s) 6-18 and 29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED OFFICE ACTION**

### **Response to Lack of Unity/Restriction Requirement**

1. This application was the subject of a Lack of Unity Requirement, mailed on 8/18/2009. The 9/18/2009 Reply elected without traverse the invention directed to Group I, Subgroup I.

The Reply confirms that claims 1-5 belong to this elected Group/Subgroup.

2. Examiner notes that the Reply failed to amend claim 1 as suggested by the 8/18/2009 Office Action. Rather, the Reply added claim 29. Claim 29 fails to have a special technical feature common with claim 5 and therefore will not be examined as being directed to a non-elected invention.

Accordingly, Examiner has withdrawn claims 6-18 and 29 from further consideration as being drawn to non-elected inventions. See 37 CFR § 1.142(b).

The Restriction Requirement is proper, is maintained, and is now made final.

### **35 U.S.C. § 102 Rejections of the Claims**

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 providing the legal bases for the anticipation rejections in this Office Action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1-5 are rejected under 35 U.S.C. § 102(b) as being anticipated by World Organization Patent Document No. WO 9914614 for a patent application by "Kane." References in this Office Action are made to the equivalent US Pat. No. 6,369,404 to "Kane."

With respect to claims 1-3:

Kane discloses (see, for example, the front page) A gate for quantum information processing comprising: at least two units (the P ions) each having a plurality of states (for example the spin states) useable for representing quantum information; and an electron system (the elections) having at least a first state (when in the ground state of the donor) a second state (when free from the donor), which states provide different amounts of interaction between said units (because the interaction between the spins of the P donor by way of the electronic system depends on whether the carriers are free from the donors or in the ground state of the donor), wherein the electron system is switchable by means of electromagnetic radiation between the first and second states to control the interaction between the units (the recited switchability is also anticipated by the device Kane discloses by way of the ability of the donor electrons to be excited when an appropriate wavelength light is directed at the device Kane discloses).

With respect to claim 4:

By basic physics, the second state, being the excited state, is not a bound state and therefore has a larger extent than the first state (the ground state bound to the donor).

With respect to claim 5:

When the electron system is in the first state (the bound ground state of the donor) the interaction between the spins of the donors (the interaction due to the bound electrons) is substantially eliminated because the bound states are not in the conduction

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band to facilitate the interaction between the spins of the donors. And when the electron system is in the second state (the excited state of the donor) the interaction between the spins of the donors (the interaction due to the excited electrons) is substantially enhanced because the excited electrons are in the conduction band to facilitate the interaction between the spins of the donors.

### CONCLUSION

5. A shortened statutory period for reply to this Office Action is set to expire **THREE MONTHS** from the mailing date of this Office Action. Applicant is reminded of the extension of time policy as set forth in 37 CFR § 1.136(a).

Any inquiry concerning this communication or earlier communications from an Examiner should be directed to Examiner Hrayr A. Sayadian, at (571) 272-7779, on Monday through Friday, 7:30 am – 4:00 pm ET.

If attempts to reach Mr. Sayadian by telephone are unsuccessful, his supervisor, Supervisory Primary Examiner Wael Fahmy, can be reached at (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available only through Private PAIR.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. The Electronic Business Center (EBC) at (866) 217-9197 (toll-free) may answer questions on how to access the Private PAIR system.

/Hrayr A. Sayadian/

Patent Examiner, Art Unit 2814